Texas Instruments Home Computer   (TI Bug)

Video
Controller Card

Model No. PHP1290

```
***********************************************
*           Graphic of Video                  *
*           Controller Card                    *
***********************************************
```

(Title Page Copy)

Texas Instruments Home Computer

Video
Controller Card
Model No. PHP1290

```
*********************************************
*                                           *
*            Graphic of Video               *
*                                           *
*            Controller Card                *
*                                           *
*********************************************
```

```
****************************************************************
*                                                              *
*                        IMPORTANT                             *
*                                                              *
*       Record the serial number from the label on the        *
*                                                              *
*       Video Controller Card and the purchase date in         *
*                                                              *
*       the space below.  The serial number is identified      *
*                                                              *
*       by the words "SERIAL NO." printed on the label.        *
*                                                              *
*       Always reference this information in any               *
*                                                              *
*       correspondence.                                        *
*                                                              *
*       PHP1290   _____   _____   _____              *
*                                                              *
*       Model No.     Serial No.      Purchase Date           *
*                                                              *
****************************************************************
```

TABLE OF CONTENTS

Federal Communications Commission Requirements Concerning Radio Frequency
Interference

The Texas Instruments Home Computer and peripherals generate and use radio
frequency (RF) energy. If not installed and used properly (as outlined in the
instructions provided by Texas Instruments), this equipment may cause
interference to radio and television reception.

This equipment has been tested and found to comply with the limits for a
Class A computing device pursuant to Subpart J of Part 15 of FCC Rules. These
rules are designed to provide reasonable protection against such interference
when operated in a commercial environment. Operation of this equipment in a
residential area is likely to cause interference, in which case the user at
his own expense will be required to take whatever measures may be required to
correct the interference.

If this equipment does cause interference to radio or television reception
(which you can determine by turning the equipment off and on), try to correct
the interference by one or more of the following measures.

- o Reorient the receiving antenna (that is, the antenna for the radio or
  television that is "receiving" the interference).
- o Change the position of the computer with respect to the radio or
  television equipment that is receiving interference.
- o Move the computer away from the equipment that is receiving
  interference.
- o Plug the computer into a different wall outlet so that the computer and
  the equipment receiving interference are on different branch circuits.

If these measures do not eliminate the interference, please consult your
dealer or an experienced radio/television technician for additional
suggestions. Also, the Federal Communications Commission has prepared a
helpful booklet, "How to Identify and Resolve Radio-TV Interference
Problems." This booklet is available from

> The US Government Printing Office
> Washington, D.C. 20402

Please specify Stock Number 004-000-00345-4 when ordering copies.

INTRODUCTION

The Texas Instruments Video Controller links your TI Home Computer to a compatible videotape or videodisc unit, resulting in a powerful, interactive video system for developing and delivering customized teaching or training programs--a system that combines the interactive and immediate feedback capabilities of the computer with the realism of recorded video.

The Video Controller is designed so that programs can be written to control the video playback unit's functions from the computer keyboard. With a TI BASIC or TI Extended BASIC program, the computer can automatically direct a videotape or videodisc to predetermined segments, with computer-generated text, questions, and branching capabilities interspersed between video segments. You can design or update courses using existing videotapes, because you can access tape segments in any order without altering the original tape. Also, you can design a new video course that takes maximum advantage of the computer's branching capabilities.

However, you do not have to be a computer programmer to design interactive video using the Home Computer system. Texas Instruments offers the Course Designer Authoring Package (sold separately), which guides you through the implementation of your courseware with step-by-step, easy-to-use instructions shown on the display, thus eliminating the need for computer programming knowledge. Check with your local dealer for information on, and a demonstration of, this powerful software.

Equipment Needs

In addition to the Video Controller, the following equipment is necessary for developing training programs.

- o TI Home Computer
- o TI Color Monitor or TI Video Modulator and a television set
- o TI Peripheral Expansion System
- o TI Disk Drive Controller and one or two TI Disk Memory Drives (two drives are recommended)
- o Compatible videotape recorder or videodisc player

If you plan to add computer speech to your course, you also need the TI <u>Solid State Speech</u>^{TM} Synthesizer, the TI Memory Expansion unit, and a specialized Solid State Cartridge, such as the Terminal Emulator II or TI Extended BASIC cartridge. By adding the TI Thermal Printer or the TI RS232 Interface and an RS232C-compatible printer to your system, you can also obtain a printout of such information as the computer portion of the course itself, the student scores on the course, or a listing of your computer program.

After the course design is completed, the following equipment is necessary for the students who are taking the course.*

- o TI Home Computer
- o TI Color Monitor or TI Video Modulator and a television set
- o TI Peripheral Expansion System
- o TI Video Controller
- o TI Disk Drive Controller and one or two TI Disk Memory Drives (two drives are recommended)
- o Compatible videotape recorder or videodisc player

If the course program is in TI Extended BASIC, the student system also requires the TI Extended BASIC cartridge and, depending on the length of the program, the Memory Expansion unit may be necessary. In addition, if the course includes computer speech, the student needs a Speech Synthesizer, the Memory Expansion unit, and either the TI Extended BASIC or Terminal Emulator II cartridge. You might also want the system to include a TI Impact Printer so that you or the student can obtain a printed copy of the scores on the course.

*IMPORTANT: If you are using a videotape unit, the course (computer program and data) can be stored on the audio dub track of the videotape, eliminating the need for students to have a TI Disk Memory System or other storage device. However, if you have a videodisc player, the course can be stored only with the Disk Memory System or the TI Program Recorder (or other compatible audio cassette recorders), making this a part of the equipment required for the students taking the course.

Compatible Recorders

The Video Controller works with certain industrial-grade video recorders that accept remote-control units. The controller may be used with both one-half inch and three-quarter inch video cassette recorders, as well as with videodisc players. The recorders known to be compatible are listed in the following table.**

1/2" Tape	3/4" Tape	Videodisc
Panasonic NV-8170	Panasonic NV-9240	Pioneer VP-1000
Panasonic NV-8200	Panasonic NV-9600	
Sony SLO-320	Sony VO-2611	
Sony SLO-323	Sony VO-2860A	
Sony SLP-300	Sony VP-2011	
Sony SLP-303	Sony 5000-series machines	

The cables needed for connecting the recorder to the controller depend on the type of recorder you have and are packaged separately. When you purchase the Video Controller, simply specify the type of your recorder, and you will be supplied with one set of the proper cables. Additional cables, such as for a second type of video unit, can be purchased separately.

**IMPORTANT: These video units operate with the TI Home Computer and the TI Video Controller. The recorder/players have not been tested by Texas Instruments except for their compatibility with Texas Instruments Home Computer equipment; they are not qualified and approved by TI. Other recorder/players may be suitable for similar use with the Home Computer system.

SET-UP INSTRUCTIONS

PLEASE READ THIS MATERIAL COMPLETELY BEFORE PROCEEDING. The steps involved in connecting the unit to the Home Computer and to the videotape or videodisc unit are included in this section. Directions for testing the system are also included.

```
************************************************************************
*                                                                    *
*                              CAUTION                               *
*                                                                    *
*    The electronic components of the Video Controller can be damaged *
*    by static electricity discharges.  To avoid damage, do not touch *
*    the connector contacts or expose them to static electricity.     *
*                                                                    *
************************************************************************
```
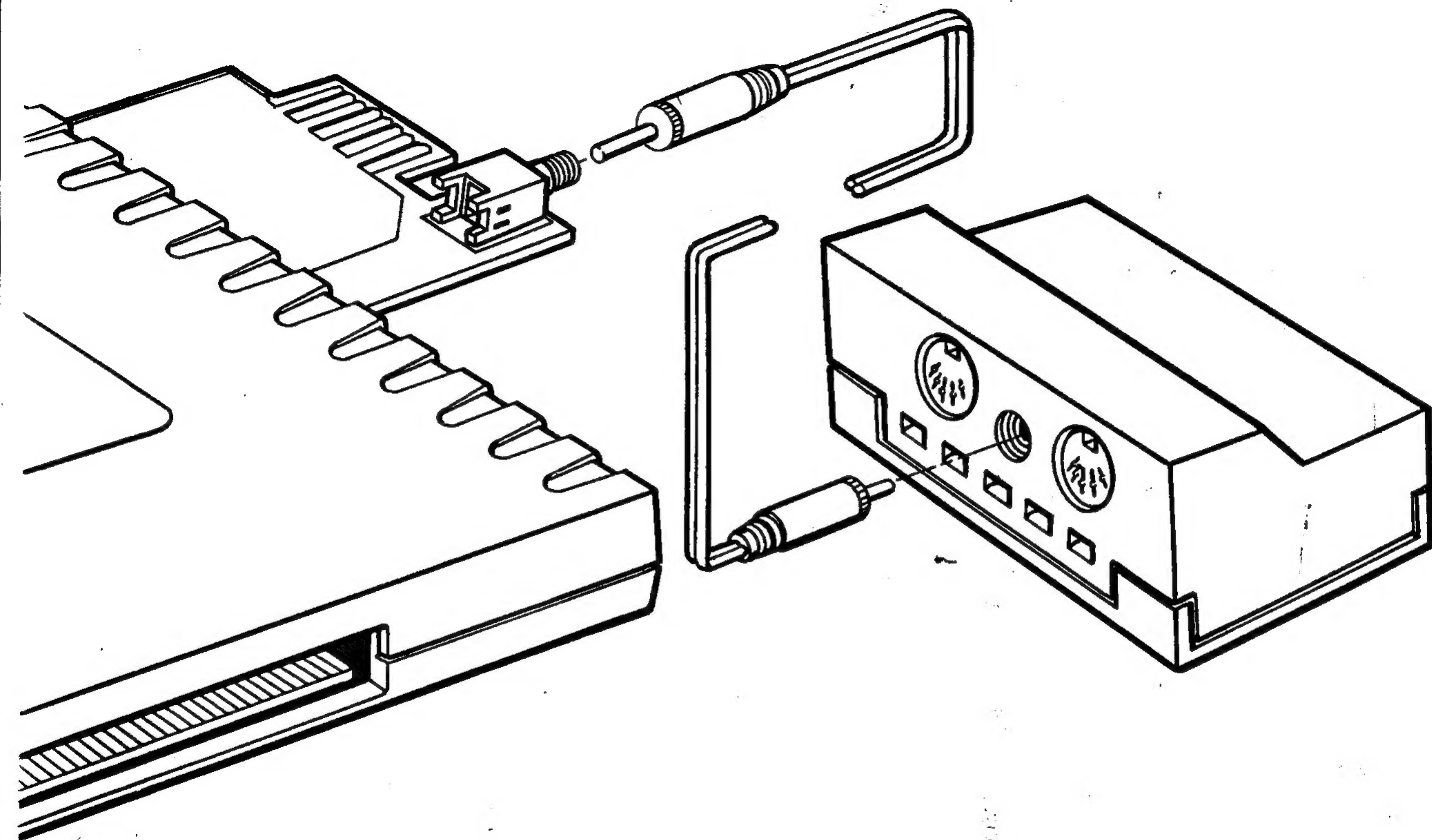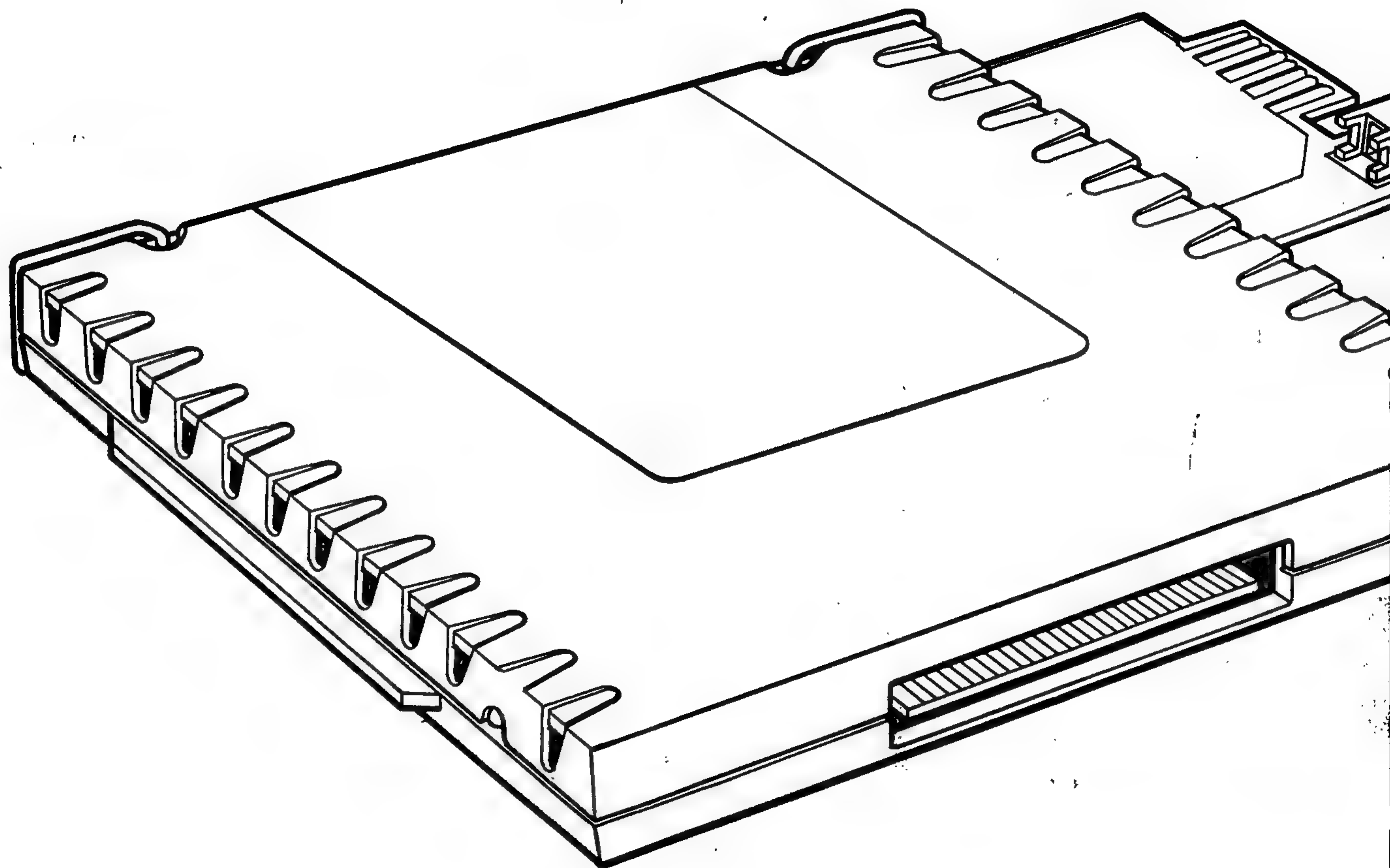
Once you've unpacked the unit, you're ready to connect the Video Controller to the Peripheral Expansion System. (Save your packing materials for storing or transporting the unit.)

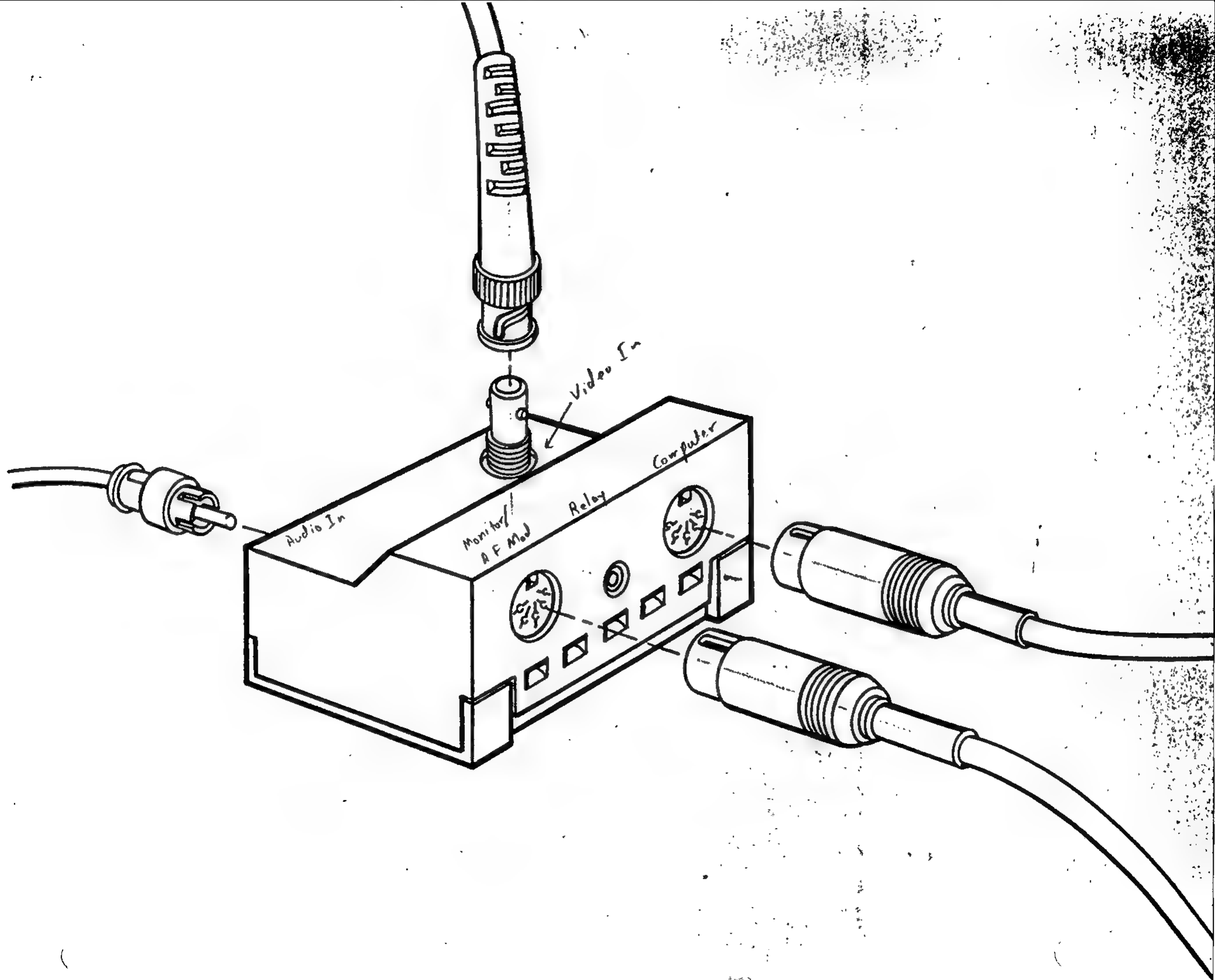Inserting the Video Controller Card in the Peripheral Expansion System

1. First, turn off the computer console, the Peripheral Expansion System, and
    all attached devices. IMPORTANT: Wait two minutes for all power supplies
    in the expansion unit to discharge, and proceed to step two.

2. Remove the Peripheral Expansion System top cover (see the owner's manual
    packed with the Expansion System for correct method of removal), and
    insert the Video Controller Card in any available connector. Be sure the
    Video Controller Card is placed correctly in the guide slots and is fully
    inserted into the connector.

3. Replace the Peripheral Expansion System top cover.

Connecting the Video Controller Relay Box to the Video Controller Card and the
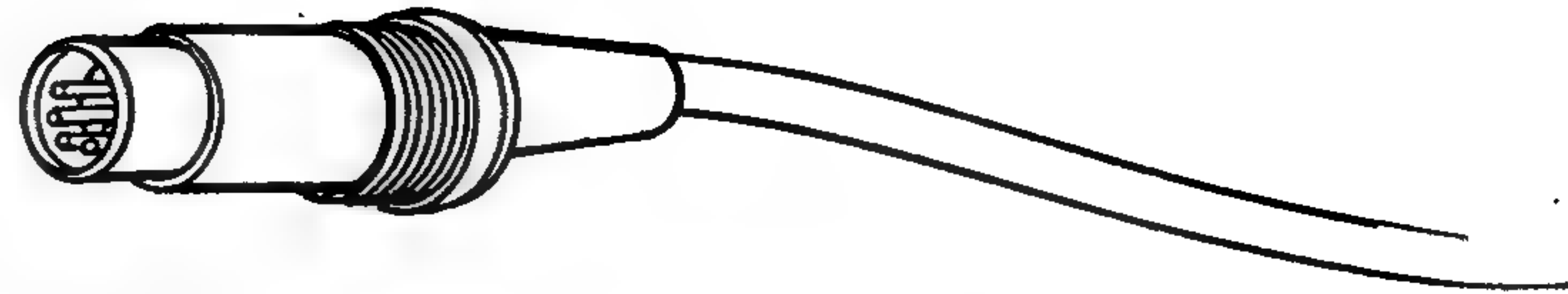Peripheral Expansion System

1. Be sure that the monitor, computer console, Peripheral Expansion System,
    video unit, and all accessory devices are turned OFF.

2. Five connecting cables and the separate relay box (all sold separately)
    are available for each of the three video units (Sony, Panasonic, or
    Pioneer) suggested for use with the TI Home Computer.

    Connect the relay box to the Video Controller Card by using the cable with
    a mini-phone plug on each end. This cable plugs into the jack on the
    Video Controller Card connector tab and the jack marked "RELAY" on the
    relay box. Attach the relay box to the back of the Peripheral Expansion
    unit or other suitable location, using the self-adhering strip on the back
    of the relay box.

```
******************************************************************************
*                                                                            *
*        Insert here a graphic of the Video Controller Card connector        *
*        tab and jack.  Also a graphic of the relay box with RELAY           *
*        CONTROL jack and the cable used for connecting them.                 *
*                                                                            *
******************************************************************************
```

Video In

Computer

Relay

Monitor/
A F Mod

Audio In

9-Pin
DIN Connector

Phono Plug

Mini
Phono Jack

F

BNC

Connecting the Video Controller Relay Box to the Video Display Unit and Computer

1. Connect the monitor or Video Modulator (if you are using a television as a video display unit) to the Video Controller Relay Box. Instead of attaching the monitor interface cable to the 5-pin DIN connector jack on the back of the computer, plug it into the relay box connector jack labeled "MONITOR/RF MOD." The other end of the cable attaches to the monitor or Video Modulator as usual.
2. Next, locate the black cable with a 5-pin DIN connector plug on each end and plug one end into the 5-pin DIN connector jack on the back of the computer console and the other end into the 5-pin DIN connector jack on the relay box labeled "COMPUTER."

Note that these two cables replace the cable that usually connects the Color Monitor or Video Modulator to the computer console.

```
**************************************************************************
*           Insert here a graphic of the Video Controller Relay         *
*           Box with cables labeled, identifying type of plug,          *
*           their corresponding connector on the relay box, and         *
*           to what their other ends will be connected.                 *
*                                                                       *
*                                                                       *
**************************************************************************
```

Connecting a Videotape or Videodisc Unit to the System

The procedure for attaching the Video Controller to a videotape or videodisc unit depends on the type of video unit you have. Directions for each of the compatible types are given here. Note that because the connections for the Panasonic and Sony machines are almost identical they are explained together, with the Pioneer machine treated separately.

Panasonic and Sony Units

1. To connect the Video Controller to a Panasonic or Sony unit, begin by
   locating the video cable with a BNC-type connector on each end. Attach
   one end to "VIDEO OUT" on the videotape unit, and attach the other end to
   "VIDEO IN" on the Video Controller Relay Box.

2. Next, locate the audio cable with an RCA phono plug on each end. Plug one
   end into the <u>main</u> audio out channel ("AUDIO OUT" on Panasonic or "LINE
   OUT" on Sony) on the videotape unit. Then plug the other end into "AUDIO
   IN" on the relay box. The remaining cable included with the Video
   Controller is the remote control cable, which gives the controller unit
   remote control over the videotape unit. (<u>Note</u>: This cable works only
   with the particular brand--Panasonic or Sony--of machine specified. For
   example, you cannot connect a Panasonic unit to the Video Controller with
   a cable designed for a Sony unit.)

3. Push the end of the remote control cable with the edge-card connector onto
   the Video Controller Card connector tab. Make sure that the connector tab
   jack and the TI symbol printed on the cable connector are on the same side
   of the connector tab.

4. Next, push the other end of the cable onto the "REMOTE" outlet on the
   videotape unit, aligning the arrow on the multi-pin cable connector with
   the arrow on the remote control connector.

5. Then plug the small black audio cable with a black plug (attached to the
   remote connector) into the <u>secondary</u> "audio out" on the tape machine
   ("AUDIO OUT" on Panasonic or "LINE OUT" on Sony).

6. Next, if you are using a recorder, plug the remaining audio cable with the
   gray plug into the <u>secondary</u> "audio in" jack. Note that this cable is not
   used with playback units. <u>Note</u>: No cables are connected to the main
   "audio in" channel.

The following drawings show the various cables as they are plugged into the
backs of the Panasonic and Sony videotape units.

(drawing of back of Panasonic)

One-Half-Inch Panasonic Unit with Connecting Cables

(drawing of back of Sony)

One-Half-Inch Sony Unit with Connecting Cables

IMPORTANT: Be sure to check the owner's manual for your videotape unit to determine which channel is the main audio channel and which is the secondary audio channel (audio dub channel).

Pioneer Unit

1. To connect the Video Controller to a Pioneer unit, begin by locating the video cable with an F-connector on one end and a BNC connector on the other. Plug the F-connector into "VIDEO OUT" on the videodisc player and attach the BNC connector to "VIDEO IN" on the relay box.

2. Next, locate the audio cable with an RCA phono plug on each end. Plug one end into "AUDIO OUT" on the videodisc player and the other end into "AUDIO IN" on the relay box. The remaining cable included with the Video Controller is the remote control cable, which gives the controller unit remote control over the videodisc unit. (Note: This cable works only with the particular brand--Pioneer, Panasonic, or Sony--of player specified.)

3. Push the miniature phone plug into the "REMOTE CONTROL" outlet on the back of the videodisc unit.

4. Then plug the other end of the remote control cable onto the Video Controller Card connector tab. Make sure that the connector tab jack and the TI symbol printed on the cable connector are on the same side of the connector tab.

The following illustration shows the various cables as they are plugged into
the back of a Pioneer videodisc unit.

(drawing of back of Pioneer)

Pioneer Unit with Connecting Cables

Starting Up the System

Note: If you are using the Pioneer Videodisc player, you do not have to set
any controls and can go on to the "Testing the Video Controller" section.

1. Be sure the video player is off, and then plug the video player unit power
    cord into a 115-volt outlet.

2. Set the controls on the front panel of the videotape unit as follows.
    IMPORTANT: Set these controls before turning the unit on; the timer
    switch on some units puts the record machine into automatic record when
    the power is first turned on. (In some cases, the names for the controls
    may be slightly different from those listed here.)

    o Set the TIMER (RECORD/OFF/PLAY) switch to OFF.
    o Set the REWIND/OFF/REPEAT switch to OFF.
    o Set the TV/LINE switch to LINE.
    o On the Panasonic unit, set the VTR/TV switch to VTR; on the Sony unit,
       set the VTR/ANT switch to VTR.
    o Set the AUDIO MONITOR switch to MIX.
    o On the Panasonic unit, set the PLAY SPEED control to the center of its
       range; on the Sony unit, set the VAR. SPEED PUSH control to OFF.
    o Set the TRACKING control to its FIXed position.
    o Set the AUDIO LEVEL for both channels 1 and 2 to their maximum
       clockwise positions.
    o Set the AUDIO LIMITER switch to ON.
    o Set the REMOTE switch on the rear panel of the Sony unit to 300.

Testing the Video Controller

1. Turn on the monitor, Peripheral Expansion System, videotape or videodisc unit, and any other attached accessories. Then turn on the computer console. The master title screen appears.

2. Press any key on the console to make the master selection list appear. Then select TI BASIC.

3. If your video unit is a videotape unit, type one of the following statements exactly as written. Be sure the ALPHA LOCK key is in the down (locked) position.

    <u>(for one-half-inch tape)</u>   OPEN #1:"VC.H",INTERNAL
        or
    <u>(for three-quarter-inch tape)</u>   OPEN #1:"VC.Q",INTERNAL

    and press ENTER.

4. If your video unit is a videodisc player, type the following statement exactly as written. Be sure the ALPHA LOCK key is in the down (locked) position.

    OPEN #1:"VC.D",OUTPUT,INTERNAL

    and press ENTER.

With either type of unit, an error message appears if the devices are not connected properly. If the devices are connected correctly, the statement you entered moves up one line on the display.

4. To check the relay controls, which determine whether the information shown on the display comes from the computer or the video unit, insert a videotape (or videodisc) and press the PLAY button on the video unit. Next, be sure that the monitor volume is turned up to an audible level. Then enter the statement

        PRINT #1:"ONRL"

   A clicking sound occurs and the display shows video from the videotape or videodisc unit if the relay is working. Note that if the video unit is stopped the display should be black. Then enter the statement

        PRINT #1:"OFFRL"

   and the relay should click again with the display showing computer-generated video. (Note: As you enter the second relay control statement, you must type carefully because the characters you type do not appear on the display.) You can then press STOP to stop your videotape.

5. The unit has now been checked and should function normally. However, if you want to perform more extensive tests, you can try one of the sample programs in the "Sample Computer Programs" section.

THE VIDEO CONTROLLER AND AUTHORING SOFTWARE

The TI Video Controller can be controlled by a TI BASIC or TI Extended BASIC program. To help you produce interactive teaching or training courses more easily, Texas Instruments offers the Course Designer Authoring Package, designed specifically for course production. After you design your course, integrating text, video segments, and questions as you want them to appear, this software guides you through the process of placing the necessary information in the computer without your having to learn computer programming. Ask your local dealer for more details on what the Course Designer package can offer you.

PROGRAMMING IN TI BASIC

Writing a TI BASIC program to combine the interactive capabilities of the computer with the realism of video offers you many application possiblities, including training-course design. The computer/video system allows you to structure a course or video presentation into "modules" of interrelated information, consisting of:

- o   Computer text,
- o   Video segments,
- o   Questions (true-false, multiple choice, etc.), and
- o   Branching points.

For your convenience, some sample programs are included in the "Sample Computer Programs" section of this manual.

The TI BASIC statements and commands for the Video Controller differ for a videotape unit and a videodisc player. In this section, these statements and commands are discussed only as they relate to the Video Controller. For a more general explanation of TI BASIC, see the BASIC Reference Section of the User's Reference Guide.

Controlling Videotape Units

If your Video Controller is connected to a videotape unit, the OPEN, CLOSE, PRINT, INPUT, SAVE, and OLD commands in TI BASIC are used to control the Video Controller and tape unit. The OPEN and CLOSE statements determine when the Video Controller is accessed. The PRINT statement lets you direct the operation of the video unit, and the INPUT statement allows you to obtain error and status information from the Video Controller. With the SAVE and OLD commands, you can save a program on the audio dub channel on the videotape or load a program from the videotape into the computer's memory.

OPEN #file-number:file-name[,file-attributes]

The OPEN statement links the Video Controller to a file-number and specifies the type of videotape machine to be controlled. (Note: This version of the OPEN statement lets you control the various functions of a videotape unit. For information on other versions of the OPEN statement, refer to the "Storing Data on a Videotape" and "Controlling a Videodisc Player" sections.)

o   File-number is a numeric expression that evaluates to an integer from 1 through 255.

o   File-name is a string expression containing the device name and the specification for the size of the videotape (VC.H or VC.Q), where H stands for one-half inch tape and Q represents three-quarter inch tape. If the type specification is omitted, H is assumed.

o   File-attributes are string expressions, separated by commas, which specify file-organization, file-type, open-mode, and record-type. With a videotape unit you only need to specify the file-type as INTERNAL. The controller is designed to assume certain specifications, called default values, for the other attributes. These default values are SEQUENTIAL organization, UPDATE mode, and VARIABLE-length records.

The following are some examples of the OPEN statement.

                    OPEN #1:"VC.H",INTERNAL

specifies file number 1 for a half-inch videotape machine, while

                    OPEN #1:"VC.Q",INTERNAL

designates file number 1 for a three-quarter-inch videotape unit.

CLOSE Statement

CLOSE #file-number

The CLOSE statement "closes" or discontinues the association between the file specified by the file-number and a program.

PRINT Statement

PRINT #file-number:string-expression-command[,parameter1]

The PRINT statement gives commands to the videotape machine via the Video Controller. For example, the statement

        PRINT #1:"ONRL"

used in the "Testing the Video Controller" section turns the relay on to show tape video. The various string-expression-commands are listed here and are explained in detail on the following pages.

                    INIT
                    GOTO, location
                    STOP
                    PLAY
                    FWD
                    REW
                    REC
                    DUB
                    PAUSE
                    ONRL
                    OFFRL

The INIT command automatically rewinds the tape and resets the internal counter to zero. The GOTO command moves the videotape to a specified location and is the only command that requires a parameter. The STOP, PLAY, FWD, REW, REC, DUB, and PAUSE commands perform the same functions as the corresponding control buttons on the videotape machine. Finally, the ONRL and OFFRL commands determine whether the output from the videotape (ONRL) or the computer (OFFRL) is displayed by the monitor (or television set).

Note: The PRINT statement for a file must be preceded by an OPEN statement for a file with the same number.

Initialization

Each time you turn on the Video Controller and videotape unit, the controller must be properly initialized immediately after the OPEN statement and before you enter any other commands. The initialization procedure ensures that the controller knows the starting position of the tape. To initialize the tape, enter the command

PRINT #x:"INIT"

where x is the same file-number used in the OPEN statement (see "OPEN Statement"). Note that you do not have to repeat the initialization procedure unless you turn the system off.

The GOTO <u>string-expression-command</u> requires a numeric parameter indicating the position to which the tape should move. For example, in the statement

PRINT #1:"GOTO",<u>location</u>

<u>location</u> evaluates to a numeric expression that indicates the location of the next video segment, relative to the "zero" or starting position. Note that PRINT #1:"GOTO",250 is also a valid statement. (See lines 150-170 of sample program 3 on page xx.)

If you have a Panasonic video recorder attached to the Video Controller, each internal tape position count corresponds to 16/30 (0.53333) of a second. With a Sony recorder, each internal count equals 16/60 (0.26667) of a second.

<u>Note</u>: Since the Video Controller determines the tape's position based on counting control track pulses, any video cassette tapes that you plan to access with the computer must have <u>continuous video information</u> recorded from the beginning of the tape with no "gaps" between video segments. A gap is a blank section of tape with no video information on it appearing as a white screen with black specks (also known as "snow"). A black screen may be considered to be a gap, however, recorded black is video information and is not recognized as a gap by the computer.

GOTO causes the videotape to stop and then either rewind or fast forward to the requested position. The speed at which the tape moves depends on how far it must go. When the current tape location gets close to the beginning of the next specified location, the tape slows down so that it does not "overshoot" the new position.

```
**********************************************************************************
*                                  CAUTION                                     *
*                                                                              *
*         If the numeric value of the parameter exceeds the total             *
*         length of the tape, the controller reinitializes and                *
*         continues to try to find the required position until you            *
*         turn the computer off.                                              *
**********************************************************************************
```

Remote Control

You can include statements in your TI BASIC program that enable you to operate the tape machine from the program as though you were pressing the controls on the machine itself. The general form for these statements is

PRINT #file-number:string-expression-command

where the string-expression-command is one of the following, enclosed in double quotation marks:

o STOP -- Stops the tape.
o PLAY -- Plays the tape at the slow forward speed.
o FWD -- Moves the tape at the fast forward speed.
o REW -- Rewinds the tape at the fast speed.
o REC -- Records video on the tape at the slow forward speed.
o DUB -- Enables data to be recorded on the audio dub track at the slow
         forward speed. Note that DUB automatically activates PLAY.
o PAUSE -- pushed once, stops the tape; pushed again, starts the tape.

Note that all of the commands automatically stop the tape before proceeding with the specified action.

Some examples of remote control statements are as follows:

    PRINT #1:"PLAY"
    PRINT #1:"REW"

Relay Control Statements

The two relay control statements are

> PRINT #file-number:"ONRL"
>   and
> PRINT #file-number:"OFFRL"

where ONRL turns the relay on (to show tape unit video) and OFFRL turns the relay off (to show computer-generated video).

When the relay is on, the video and primary audio tracks from the videotape are displayed on the monitor. If the relay is off, the monitor receives its input from the computer.

When you first turn on the system, the relay control is automatically set to "off."

INPUT Statement

INPUT #file-number:position[,brand]

The INPUT statement lets you read the position of the tape in the videotape unit. However, before you can use the INPUT statement, a file with the same number must have been previously OPENed.

In the statement, position indicates the current position of the tape when the statement is read. Brand specifies the brand of tape machine in use, which is either 0 for the Panasonic unit or 1 for the Sony unit. The brand parameter may be omitted.

With the INPUT statement, you can check to see whether or not the videotape has reached a particular position. For example, you can use the INPUT statement to determine when the videotape reaches the end of a specified video segment. (See lines 400-410 in sample program 1 on page xx.)

SAVE Command

SAVE VC[.x]
SAVE VCA[.x]

Either of these forms of the SAVE command records your computer program on the audio dub track of the videotape, but neither one works with a videodisc because dubbing is not allowed. When the SAVE VC[.x] command* is entered, the tape moves to its starting position (initializes). The program is then recorded. With the SAVE VCA[.x] command*, the program is recorded, starting at the current position of the tape. In either case, after the recording is completed, the computer verifies the program by rewinding the tape to the required position and checking the information. Then the computer returns to TI BASIC, and error messages are displayed if necessary.

*In the SAVE VC[.x] or SAVE VCA[.x] command format, x indicates the size of the tape, either H for one-half inch or Q for three-quarter inch. If the size is not specified, one-half inch tape is assumed. Thus, the following commands are equivalent.

SAVE VCA.H
SAVE VCA

OLD VC[.x]
OLD VCA[.x]

Either of these forms of the OLD command loads a previously saved program from
the videotape into the computer's memory. When you enter the OLD VC[.x]
command*, the tape moves to its starting position (initializes) and begins
loading the program from the tape. With the OLD VCA[.x] command*, you must
position the tape at the start of the program, because the command loads the
program from the position of the tape when the command is entered. After the
loading is completed, the computer returns to TI BASIC, and displays error
messages if necessary.

*In the OLD VC[.x] or OLD VCA[.x] command format, x indicates the size of the
tape, either H for one-half inch or Q for three-quarter inch. If the size is
not specified, one-half inch tape is assumed. Thus, the following commands
are equivalent.

OLD VCA.H
OLD VCA

Note: In TI Extended BASIC, the statements RUN "VC" and RUN "VCA" are also
acceptable. See the TI Extended BASIC owner's manual for additional
information.

Storing Data on a Videotape

You can also store data on the audio dub track of your videotape, without
altering the video and primary audio tracks. In this way, you eliminate the
need for a mass storage device, such as the Disk Memory System or the Program
Recorder, as part of the equipment required for each student station. (Note:
Using the audio dub track as a mass storage device is slower than using the
Disk Memory System.)

The statements and commands necessary for storing and reading the data on the
tape are OPEN, CLOSE, PRINT, and INPUT. The OPEN and CLOSE statements
determine when the audio dub track can be accessed. The PRINT statement lets
you record the data, while the INPUT statement allows you to input the stored
data to the computer.

Note that to store or input data, your program must include at least two OPEN, CLOSE, PRINT, and INPUT statements. The first "set" of these statements is necessary to let you control the videotape unit's functions as shown on the machine's front panel (see the "Controlling Videotape Units" section). The second set of statements lets you read from and write to the audio dub track on the video tape. These statements are discussed in this section. See the sample program "Storing and Reading Data on a Videotape" in the sample program section on page xx.

Note the difference between a program and data. The program is the series of instructions that are loaded into the computer from the keyboard, a diskette, or an audio cassette to make it operate the video unit and present the course. The data which are stored either on disc, cassette tape, or video tape are the results of the use of the course (such as a test score).

OPEN Statement

OPEN #file-number:file-name[,file-attributes]

As in writing a TI BASIC program to develop a course, the OPEN statement links the Video Controller to a file-number and specifies the size of the tape in the recorder. However, this version of the OPEN statement lets you transfer data to and from the audio dub track on the videotape. For example,

OPEN #1:"VCA.H",FIXED 128,INTERNAL

indicates that you are going to transfer data with a fixed record length of 128 to and from a one-half inch videotape.

o   File-number is a numeric expression that evaluates to an integer from 1 through 255.

o   File-name is a string expression containing the device name, VCA, and the type specification for the size of the tape. With one-half inch tape, the type is H; and with three-quarter inch tape, the type is Q.

Note that in order to indicate that <u>data</u>, instead of a computer program, are to be stored on the audio dub track, you should enter the <u>file-name</u> (VCA.H or VCA.Q). If the video unit type specification is omitted, it is assumed to be H.

o <u>File-attributes</u> are string expressions, separated by commas, which specify file-organization, file-type, open-mode, and record-type. In this case, you need only to specify the file-type as INTERNAL and the record-type as FIXED yy, where yy is 64, 128, or 192, depending on the length of your data. (For directions on determining the length of your data, refer to the BASIC Reference Section of the <u>User's Reference Guide</u>.) Note that the controller is designed to assume certain specifications, called <u>default values</u>, for the other attributes. File attributes of APPEND, VARIABLE, and RELATIVE are not allowed.

Some examples of the OPEN statement are shown here.

OPEN #2:"VCA.H",FIXED 64,INTERNAL

specifies file-number 2 for a videotape unit with half-inch tape and a fixed record length of 64, while

OPEN #3:"VCA.Q",FIXED 192,INTERNAL

specifies file-number 3 for a three-quarter inch tape with a record length of 192.

Remember that two OPEN statements are required. The first one gives you control over the videotape unit's various functions (see "Controlling Videotape Units"), and the second one lets you access the audio dub track on the videotape.

<u>CLOSE</u> <u>Statement</u>

CLOSE #<u>file-number</u>

The CLOSE statement "closes" or discontinues the association between the file specified by the <u>file-number</u> and audio dub track of the videotape.

Remember, you need one CLOSE statement for each OPEN statement in order to close each of the opened files.

PRINT Statement

PRINT #file-number[:print-list]

When used for storing data on the audio dub track of the video tape, two types of PRINT statements are needed. The first type places the Video Controller in the DUB mode to move the tape as the data is recorded. The format for the statement is

PRINT #file-number:"DUB"

where file-number is the number of the OPENed file which lets you control the videotape unit's functions (see "Controlling Videotape Units").

After the unit is in DUB mode, the second type of PRINT statement outputs the data to the audio dub track of the video tape. In this case, the format of the statement is

PRINT #file-number[:print-list]

where file-number is the number of the OPENed file which lets you read from or write to the audio dub track on the video tape, and print-list is any valid list as explained in the BASIC Reference Section of the User's Reference Guide. See the sample program "Storing and Reading Data on a Videotape" on page xx.

INPUT Statement

INPUT #file-number[:input-list]

This version of the INPUT statement reads data from the audio dub track of the video tape. Before the INPUT statement is used, a PRINT statement must be included to put the videotape unit in the PLAY mode (see "Controlling Videotape Units").

To read from the audio dub track, the file-number must be the same as the one in the OPEN statement that lets you access the audio dub track. The input-list in the INPUT statement is any valid list as explained in the BASIC Reference Section of the User's Reference Guide. It must match the print-list that was used to store the data. For example, if a string variable (such as a students name) has been stored followed by numeric data (such as a score), the input-list must first read the variable followed by the numeric variable. Note the similarity of the INPUT and PRINT statements in the sample program "Storing and Reading Data on a Videotape" on page 35.

Remember that two types of INPUT statements for the Video Controller can be included in your program. The other type lets you read the position of the videotape (see "Controlling Videotape Units") when the file-number is the same as the one in the OPEN statement which gives you control over the unit's functions.

Controlling a Videodisc Player

If your Video Controller is connected to a videodisc player, the OPEN, CLOSE, and PRINT statements in TI BASIC are used to control the Video Controller and the disc player. Although in some cases the formats are different, the commands generally perform the same functions as they do with a videotape unit.

Note: Files cannot be stored on a videodisc.

OPEN Statement

OPEN #file-number:file-name[,file-attributes]

This version of the OPEN statement links the Video Controller to a file-number and indicates that you are using a videodisc player.

o - File-number is a numeric expression that evaluates to an integer from 1 through 255.

o   File-name is a string expression containing the device name and type (VC.D).

o   File-attributes are string expressions, separated by commas, which
         specify file-organization, file-type, open-mode, and record-type. You
         only need to specify the open-mode as OUTPUT and the file-type as
         INTERNAL. The controller is designed to assume certain specifications,
         called default values, for the other attributes.

When the videodisc player is OPENed, no further initialization is necessary.
The OPEN statement for a disc player with a file-number of 1 is shown here.

                         OPEN #1:"VC.D",OUTPUT,INTERNAL

Note that you must CLOSE a file before attempting to OPEN another one or the
monitor will display "FILE ERROR" messages.

CLOSE Statement

CLOSE #file-number

The CLOSE statement "closes" or discontinues the association between the file
specified by the file-number and a program.

PRINT Statement

PRINT #file-number:argument1[,argument2]

The PRINT statement gives commands to the videodisc player via the Video
Controller. These commands have two functions:

         1.   They can indicate a time delay while an operation is performed

                                      or

         2.   They can be used to generate laser disc front panel control
              functions.

Refer to "Remote Control" on page xx or "Delay Mode" on page xx.

Note: The videodisc player does not provide the Video Controller with any
information on the frame currently displayed. Therefore, as you play a video
segment starting at a specified frame, you must estimate the end of the
segment by timing its duration (see "Delay Mode").

Remote Control

You can include statements in your TI BASIC program which enable you to
operate the disc player from the program as though you were pressing the
controls on the player itself. The general form for these statements is:

PRINT #file-number:string-expression-command

where string-expression-command is one of the following, enclosed in double
quotation marks:

o   PLAY -- Plays the disc at regular speed.

o   SCAN -- Initiates a fast scan of the disc.

o   SLOW -- Plays the disc in slow motion.

o   FAST -- Initiates a fast play of the disc.

o   STEP -- Steps through the disc one frame at a time.

o   PAUSE -- Pushed once, stops the disc; pushed again, starts the disc.

o   FRAME -- Acts as a switch to display frame numbers.

o   CHAPTER -- Acts as a switch to display chapter numbers (a chapter consists
                    of many frames).

o   SEARCH -- Searches for a specific frame or chapter.

o   L/1 -- Acts as an on/off switch for the left audio channel.

o   R/2 -- Acts as an on/off switch for the right audio channel.

In some instances, you may want to specify the direction, either forward or
backward, in which you want the disc to move. If so, you can include a
direction modifier of FORWARD or REVERSE after the SCAN, SLOW, FAST, and STEP
commands. For example, the statement

PRINT #1:"SCAN","REVERSE"

tells the videodisc player to scan the disc in reverse. Note that if no
direction modifier is specified the default direction is FORWARD.

The PRINT statement can also be used to locate a specific frame or chapter on the disc. To do this, simply follow the SEARCH command with the FRAME or CHAPTER command and a numeric string that specifies the particular frame or chapter. The format for the search command is either of the following:

PRINT #file-number:"SEARCH",["CHAPTER",]position
PRINT #file-number:"SEARCH",["FRAME",]position

where position is a value, consisting of from one to five numerical characters, that references a specific frame or chapter position on the disc.

For example, the statement

PRINT #1:"SEARCH","FRAME","45"

tells the videodisc player to search for frame 45 on the disc. The statement could also be written as

PRINT #1:"SEARCH","45"

because "FRAME" is optional in the format of the statement. When the videodisc reaches frame 45, it stops until it receives additional commands.

Relay Control Statements

The two relay control statements are

PRINT #file-number:"ONRL"
and
PRINT #file-number:"OFFRL"

where ONRL turns the relay on and OFFRL turns the relay off.

When the relay is on, the videodisc player displays on the monitor. If the relay is off, the monitor receives its input from the computer.

When you first turn on the system, the relay control is automatically set to "off."

Delay Mode

In the Delay Mode, you can specify a precise length of time for the program to pause. In this case, the only argument (the value in an input/output statement) included in the PRINT statement is a non-negative integer, indicating the length of the delay in tenths of a second. Because a disc player receives no synchronization pulses to pinpoint start and stop locations on a disc, the program can tell the machine only where to start and how long to play while the program pauses for the video segment. For example, the statement

PRINT #1:102

tells the computer to pause the program for 10.2 seconds.

Note: The delay time is a numeric expression, and the remote control and relay control commands are string expressions.

SAMPLE COMPUTER PROGRAMS

The four examples included in this section are designed to illustrate how the statements and commands explained in the "Programming in TI BASIC" section are used in a program.

Displaying Video Segments

This program shows how to specify two tape segments from a one-half inch videotape unit. You can then press 1 or 2 on the computer keyboard to select the tape segment to be displayed.

Line 110 of the program gives you access to the functions on a one-half inch videotape machine. Lines 140 and 150 indicate the beginning and end of the first tape segment, and lines 160 and 170 indicate the beginning and end of the second segment. Line 190 initializes the tape. A selection list is displayed on the screen as a result of lines 210-230. Next, lines 240-330 check to see if you pressed a key; if 1 or 2 was pressed, the tape is moved to the corresponding starting location (line 310). Line 350 delays the program to give the tape unit time to start. Line 380 sets the relay control so that the videotape output is displayed on the monitor. Lines 400 and 410 check the tape's position to determine when the end of the segment is reached. Lines 430 and 440 stop the videotape output to the monitor and stop the tape. Line 450 returns the program to the option list.

```
100 REM SPECIFY DEVICE USED
110 OPEN #1:"VC.H",INTERNAL
120 REM VIDEO TAPE SEGMENT ADDRESSES
130 CALL CLEAR
140 START(1)=204
150 ENDING(1)=275
160 START(2)=337
170 ENDING(2)=593
180 REM INITIALIZE THE VCR
190 PRINT #1:"INIT"
200 REM SELECT A SEGMENT
210 PRINT "      PRESS ONE OF THE              FOLLOWING KEYS:"::
220 PRINT "  1 FOR VIDEO SEGMENT 1":
230 PRINT "  2 FOR VIDEO SEGMENT 2":::::
240 CALL KEY(0,KEY,STATUS)
250 IF STATUS <> 1 THEN 240
260 KEY=KEY-ASC("0")
270 IF KEY < 1 THEN 240
280 IF KEY > 2 THEN 240
290 REM KEY IS EITHER 1 OR 2
300 REM NOW MOVE TAPE TO STARTING ADDRESS
310 PRINT #1:"GOTO",START(KEY)
320 REM TAPE IS NOW AT STARTING ADDRESS
330 PRINT #1:"PLAY"
340 REM DELAY UNTIL TAPE BEGINS MOVING
350 FOR DELAY=1 TO 1000
360 NEXT DELAY
370 REM TURN RELAY ON
380 PRINT #1:"ONRL"
390 REM KEEP LOOKING FOR END OF VIDEO SEGMENT
400 INPUT #1:POSITION
410 IF POSITION < ENDING(KEY) THEN 400
```

```
420 REM TURN OFF RELAY AND STOP THE TAPE
430 PRINT #1:"OFFRL"
440 PRINT #1:"STOP"
450 GOTO 240
```

Storing and Reading Data on a Videotape

If no disk system is available, it is still possible to store test data by
writing to a file on the second audio track of a video tape cassette. When
using only one datafile, the proper procedure for updating or appending the
file is:

1. Position the tape to the beginning of the file to be read. Read the
   contents of the old file reading the elements in the INPUT statement
   in the same order as they were written. (See program lines 680-780
   below.)

2. Update the file contents of memory to desired configuration.
   (Example: For Option 3, "TEST YOUR ADDITION SKILLS", see lines
   270-530.)

3. Reposition the tape to the beginning of the file. Write the contents
   of the updated file using PRINT statements to the second audio track
   of the video cassette tape.

NOTE: When writing a file the computer writes over any data previously
recorded at that location. If the information at that location is to be
retained, the file should be read and rewritten to a blank tape location or
stored on some other data media.

Multiple files offer the advantage of not having to spend time accessing files
which are not to be updated. For writing to multiple files, you must make
certain that the file storage locations do not overlap. To avoid this, a
directory of file locations should be created and referred to when reading
from or writing to a file.

Below is a sample program which creates a small test and stores the students' names and scores. Students should use option 3 ("TEST YOUR ADDITION SKILLS" in line 210). Options 1, 2, and 4 are for the instructor. The program contains a variable, "FILELC", which contains the starting location of the score file.

```
100 REM  ADDITION SKILLS TESTER
110 REM  USING VIDEO TAPE FOR STORAGE OF SCORES
120 OPTION BASE 1
130 DIM NAME$(100),SCORE(100)
140 FILELC=250
150 OPEN #1:"VC",INTERNAL
160 OPEN #2:"VCA",INTERNAL,FIXED 64
170 CALL CLEAR
180 PRINT "YOUR OPTIONS ARE:"
190 PRINT "1  INITIALIZE FILE"
200 PRINT "2  CLEAR OLD TEST SCORES"
210 PRINT "3  TEST YOUR ADDITION SKILLS"
220 PRINT "4  PRINT TEST SCORES"
230 PRINT "5  STOP"
240 INPUT "INPUT YOUR CHOICE ":C
250 CALL CLEAR
260 ON C GOTO 540,540,270,590,670
270 GOSUB 700
280 IF DIMNUM<=100 THEN 310
290 PRINT "SORRY THE SCORE FILE IS FULL."
300 GOTO 170
310 INPUT "WHAT IS YOUR NAME?            ":N$
320 INPUT "HOW MANY QUESTIONS DO YOU WANT TO ANSWER?":N
330 TOTAL=0
340 RANDOMIZE
350 CALL CLEAR
360 FOR I=1 TO N
370 X=INT(RND*100)
380 Y=INT(RND*100)
```

```
390 Z=X+Y
400 INPUT STR$(X)&"+"&STR$(Y)&"= ":ANS
410 IF ANS<>Z THEN 450
420 TOTAL=TOTAL+1
430 PRINT "THAT IS CORRECT"
440 GOTO 460
450 PRINT "THE ANSWER IS ";X;"+";Y;"=";Z
460 NEXT I
470 DIMNUM=DIMNUM+1
480 NAME$(DIMNUM)=N$
490 SCORE(DIMNUM)=100*TOTAL/N
500 PRINT "YOUR PERCENTAGE CORRECT IS ";SCORE(DIMNUM)
510 PRINT "PLEASE WAIT WHILE I STORE YOUR SCORE"
520 GOSUB 810
530 GOTO 650
540 REM   CLEAR SCORES
550 PRINT "CLEARING SCORES"
560 DIMNUM=0
570 GOSUB 810
580 GOTO 170
590 REM   PRINT SCORES
600 GOSUB 700
610 IF DIMNUM<>0 THEN 640
620 PRINT "NO SCORES EXIST"
630 GOTO 670
640 FOR I=1 TO DIMNUM
650 PRINT NAME$(I),SCORE(I)
660 NEXT I
670 CLOSE #2
680 CLOSE #1
690 STOP
700 REM   READ SCORE FILE
710 PRINT "READING SCORE FILE"
720 PRINT #1:"GOTO",FILELC
730 PRINT #1:"PLAY"
740 INPUT #2:DIMNUM
750 FOR I=1 TO DIMNUM
760 INPUT #2:NAME$(I),SCORE(I)
```

```
770 NEXT I
780 PRINT #1:"STOP"
790 CALL CLEAR
800 RETURN
810 REM  WRITE SCORE FILE
820 PRINT #1:"GOTO",FILELC
830 PRINT #1:"DUB"
840 PRINT #2:DIMNUM
850 FOR I=1 TO DIMNUM
860 PRINT #2:NAME$(I),SCORE(I)
870 NEXT I
880 PRINT #1:"STOP"
890 RETURN
900 END
```

Displaying a Videodisc Frame

This example illustrates how to specify a frame to be displayed from a
videodisc player.

Line 110 gives you access to the functions of a Pioneer videodisc player.
Line 120 allows you to indicate a frame number on the videodisc. Line 130
allows the videodisc player to search for the specified frame. Line 140 sets
the relay control so that the videodisc output is displayed on the monitor.
Line 150 delays the program while the videodisc player is finding the frame.
Lines 160 and 170 check for a key press to restart the procedure. Line 180
switches the relay back to the computer output. Line 190 starts the program
over again.

```
100 CALL CLEAR
110 OPEN #1:"VC.D",INTERNAL,OUTPUT
120 INPUT "FRAME NUMBER?":X$
130 PRINT #1:"SEARCH",X$
140 PRINT #1:"ONRL"
150 PRINT #1:100
```

```
160 CALL KEY(0,KEY,STATUS)
170 IF STATUS = 0 THEN 160
180 PRINT #1:"OFFRL"
190 GOTO 120
```

ERROR CODES

When an error occurs in a program, an error code appears at the bottom of the
display screen. The normal error codes are given in the User's Reference
Guide with the error codes related to the Video Controller listed in this
section.

Error codes are two-digit numbers. The first digit indicates the command or
statement involved in the error, and the second digit tells you the type of
error.

FIRST DIGIT	COMMAND or STATEMENT
0	OPEN
1	CLOSE
2	INPUT
3	PRINT
5	OLD
6	SAVE

SECOND DIGIT	TYPE OF ERROR
0	The Video Controller is not correctly attached to the computer.
2	The argument (or value) in an Input/Output statement is incorrect.
4	No videotape is inserted in the unit.
6	The remote control cable is plugged into the Video Controller upside down.

In Case of Difficulty

If the Video Controller unit or other attached devices do not seem to be working properly, check the following:

1. <u>Power</u> -- Be sure the Peripheral Expansion System is plugged in and the power switch is on (depressed position). Also, be sure the videotape or videodisc player is plugged in and turned on.

2. <u>Videotape Player</u> -- Check the control settings on the front panel of the videotape unit to be sure they are set according to the directions in the "Set-Up Instructions." Note that with a videodisc player, controls need not be set.

3. <u>Program Errors</u> -- Be sure all commands and statements are used as described in this manual and the <u>User's Reference Guide.</u> Check the operation of the controller unit following the directions in "Testing the Video Controller." If the controller unit works properly when tested, but not with a program, the difficulty may be with the program.

4. <u>Cables</u> -- Check the cables for loose or broken leads, and be sure the cables are connected according to the directions in the "Set-Up Instructions."

If the Video Controller unit and videotape or videodisc unit still do not appear to be working properly, first turn <u>all</u> power off. Next, <u>disconnect</u> the Peripheral Expansion System and all other accessories from the console. Also, disconnect all cables connecting the controller unit to the console, monitor, and videotape or videodisc unit. Then follow these steps:

1. See if the Home Computer, by itself, is working properly. Connect the
    Home Computer to the monitor and turn on the monitor and computer. Press
    any key and the master selection list appears. Now select TI BASIC. Type
    OPEN #1:"VC",INTERNAL and press ENTER. The error message, "I/O ERROR 00,"
    should be displayed, indicating that the device named could not be
    OPENed. This is the expected result if the Video Controller is not
    connected to the console.

2. See if the video unit, by itself, is working properly. Follow the owner's
    manual instructions for your videotape or videodisc unit to check its
    operation. Also, make sure that the video unit responds to remote control
    by using its own remote control unit instead of the Video Controller.

3. Check to see that the Video Controller is working properly. Refer to the
    "Set-Up Instructions" and reconnect the Video Controller and videotape or
    videodisc unit. Then test the controller unit according to the directions
    in "Testing the Video Controller."

4. Check the videotape or videodisc player. Be sure that you have connected
    the remote control cable to the Video Controller and videotape or
    videodisc unit and turned the unit on. Then enter and run one of the
    sample programs.

5. If none of the above procedures corrects the difficulty, consult "If You
    Have Questions or Need Assistance" on page xx of this manual or see the
    "Maintenance and Service Information" section of the User's Reference
    Guide.

If the Video Controller is in warranty, it will be repaired or replaced under the terms of the Limited Warranty. (Also, see below for information about our optional Exchange Center Service.) Out-of-warranty units in need of service will be repaired or replaced with reconditioned units (at TI's option), and service rates in effect at the time of return will be charged. Because our Service Facility serves the entire United States, it is not feasible to hold units while providing service estimates. For advance information concerning our service charges, please call our toll free number listed in "If You have Questions or Need Assistance."

Exchange Centers (Local Service Options)

If your Video Controller requires service, instead of returning the unit to a service facility for repair or replacement, you may elect to exchange the unit for a factory-reconditioned Video Controller of the same model (or equivalent model specified by TI) by going in person to one of the exchange centers which have been established across the United States. A handling fee will be charged by the exchange center for in-warranty exchanges of the Video Controller unit. Out-of-warranty exchanges will be charged at the rates in effect at the time of the exchange.

To determine if there is an exchange center in your area, look for Texas Instruments Exchange Center in the white pages of your telephone directory, or look under the "Computers--Service and Repair" heading in the yellow pages. Please call the exchange center for availability and exchange fee information. Write the Consumer Relations Department for further details and the location of the nearest exchange center.

If You Have Questions or Need Assistance

If you have questions concerning Video Controller repair or peripheral, accessory, or software purchase, please call our Consumer Relations Department at 800-858-4565. The operators at these numbers cannot provide programming assistance.

For technical questions about programming, specific applications, etc., you can call 806-741-2663. Please note that this is not a toll-free number, and we cannot accept collect calls.

As an alternative, you can write to:

    Consumer Relations Department
    Texas Instruments Incorporated
    P.O. Box 53
    Lubbock, Texas 79408

Because of the number of suggestions which come to Texas Instruments from many sources containing both new and old ideas, Texas Instruments will consider such suggestions only if they are freely given to Texas Instruments. It is the policy of Texas Instruments to refuse to receive any suggestions in confidence. Therefore, if you wish us to review any BASIC language program which you have developed, please include the following statement in your letter:

> "All of the information forwarded herewith is presented to Texas Instruments on a nonconfidential, nonobligatory basis; no relationship, confidential or otherwise, expressed or implied, is established with Texas Instruments by this presentation. Texas Instruments may use, copyright, distribute, publish, reproduce, or dispose of the information in any way without compensation to me."

THREE-MONTH LIMITED WARRANTY FOR VIDEO CONTROLLER

THIS TEXAS INSTRUMENTS VIDEO CONTROLLER WARRANTY EXTENDS ONLY TO THE ORIGINAL CONSUMER PURCHASER OF THE VIDEO CONTROLLER.

WARRANTY DURATION

This Texas Instruments Video Controller is warranted for a period of three (3) months from the date of the original purchase by the consumer.

WARRANTY COVERAGE

This Texas Instruments Video Controller is warranted against defective materials and construction. THIS WARRANTY IS VOID IF THE VIDEO CONTROLLER HAS BEEN DAMAGED BY ACCIDENT, UNREASONABLE USE, NEGLECT, IMPROPER SERVICE OR OTHER CAUSES NOT ARISING OUT OF DEFECTS IN MATERIALS OR CONSTRUCTION.

WARRANTY DISCLAIMERS

ANY IMPLIED WARRANTIES ARISING OUT OF THIS SALE, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED IN DURATION TO THE ABOVE THREE-MONTH PERIOD. TEXAS INSTRUMENTS SHALL NOT BE LIABLE FOR LOSS OF USE OF THE PRODUCT OR OTHER INCIDENTAL OR CONSEQUENTIAL COSTS, EXPENSES, OR DAMAGES INCURRED BY THE CONSUMER OR ANY OTHER USER.

Some states do not allow the exclusion or limitation of implied warranties or consequential damages, so the above limitations or exclusions may not apply to you.

LEGAL REMEDIES

This warranty gives you specific legal rights, and you may also have other rights that vary from state to state.

WARRANTY PERFORMANCE

During the above three-month period, your Video Controller will be repaired or replaced with a new or reconditioned unit of the same or equivalent model (at TI's option) when the unit is returned either in person or by prepaid shipment to a Texas Instruments Service Facility listed below.

The repaired or replacement unit will be warranted for three months from date of repair or replacement. Other than the cost of postage or shipping the unit to Texas Instruments, no charge will be made for the repair or replacement of in-warranty units.

Texas Instruments strongly recommends that you insure the unit for value, prior to shipment.

TEXAS INSTRUMENTS CONSUMER SERVICE FACILITIES

U.S. Residents

Texas Instruments Service Facility
2303 North University
Lubbock, Texas 79415

Canadian Residents

Geophysical Services Incorporated
41 Shelley Road
Richmond Hill, Ontario, Canada L4C5G4

Consumers in California and Oregon may contact the following Texas Instruments offices for additional assistance or information.

Texas Instruments Consumer Service
831 South Douglas Street
El Segundo, California 90245
(213) 973-1803

Texas Instruments Consumer Service
6700 Southwest 105th
Kristin Square, Suite 110
Beaverton, Oregon 97005
(503) 643-6758